

### **REMARKS**

The foregoing amendment amends Claim 1 to clarify the claimed invention. Claims 1-41 are currently pending in this application. For the reasons set forth below, Applicant believes that the objections and rejections should be withdrawn and that Claims 1-41 are in condition for allowance.

### **REJECTION OF CLAIMS 1-6 UNDER 35 U.S.C. 102(b)**

The Examiner rejected Claims 1-6 under 35 U.S.C. 102(b) as anticipated by U.S. Patent No. 4,975,821 to Lethellier ("Lethellier"). In order to anticipate a claim under 35 U.S.C. 102(b), a reference must disclose each and every element of a claim. As discussed below, this rejection is respectfully traversed.

#### **Claim 1**

The foregoing amendment to Claim 1 clarifies that the saturable reactor is operated in a range including a *saturation region*. (*emphasis added*). This aspect of the invention of Claim 1 is described in various sections throughout the specification. (*See e.g.*, [0074]; [0080]; and Figs. 9 and 10). The DC converter of the present invention requires that the saturable reactor SL1 operates in a range including a saturation region  $H_s$  to increase the current saturable reactor SL1i. ([0074]; Fig. 9).

Lethellier does not disclose a saturable reactor operating in a range including a saturation region, as required by Claim 1. Lethellier discloses a parallel inductance  $L_p$  of the primary of transformer  $T_1$  that operates as an excitation inductance of the transformer. The excitation inductance of Lethellier is operated in an unsaturated region. (*See* Fig. 2 and Column 4, lines 9-24). The saturable reactor recited by Claim 1 does not operate as an excitation inductance. Lethellier fails to describe a saturable reactor operating in a range including a saturation region, as required by Claim 1. Accordingly, Claim 1 is not anticipated by Lethellier.

Additionally, in rejecting Claim 1, the Examiner alleged that the diode CR2 and capacitor C1 of Lethellier (Fig. 2) corresponds to the rectifying/smoothing circuit recited by the claim. Lethellier describes that one side of the secondary winding of the transformer T2 is connected through a diode CR2 and through a filter inductor L1 to one of the output terminals of the circuit. (Column 3, lines 5-7). Figure 2 of Lethellier illustrates that a diode CR3 is connected between diode CR2 and inductor L1, and a capacitor C1 is connected across the output terminals. The diode CR2 and the capacitor C1 are not connected in parallel with the secondary winding of the transformer and thus Lethellier does not describe a rectifying/smoothing circuit connected in parallel with a secondary winding of the transformer, as required by Claim 1.

In one embodiment of the invention illustrated in Figure 5, the first end of the secondary winding 5b is connected to the anode of the diode D1, and the cathode of the diode D1 and the second end of the secondary winding 5b are connected to the capacitor C4. (Fig. 5 and [0066]). Thus, a series circuit composed of the diode D1 and the capacitor C4 form the rectifying/smoothing circuit connected in parallel with the secondary winding 5b, wherein the capacitor C4 smoothes a rectified voltage of the diode D1 and provides a DC output to the RL.

A comparison of Figure 2 of Lethellier to Figure 5 of the present invention clearly illustrates that Lethellier does not disclose or suggest the rectifying/smoothing circuit as claimed. Lethellier fails to describe a rectifying/smoothing circuit connected in parallel with a secondary winding of the transformer and including a rectifying element and a smoothing element, as required by Claim 1. Accordingly, Claim 1 is not anticipated by Lethellier.

#### **Claims 2-6**

Claims 2-6 depend from Claim 1. Accordingly, for at least the same reasons discussed above, Claims 2-6 are patentable over Lethellier.

**REJECTION OF CLAIMS 1-12, 15-22, 25, 26 AND 28-36 UNDER 35 U.S.C. 103(a)**

The Examiner rejected Claims 1-12, 15-22, 25, 26 and 28-36 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,126,931 to Jitaru ("Jitaru") in combination with Applicant's prior art Figure 1 ("PA 1") and U.S. Patent No. 5,790,389 to Hua ("Hua"). The Examiner has not established a prima facie case of obviousness. To establish a prima facie case of obviousness, the Examiner must: (1) identify the reason why a person of ordinary skill in the art would have combined the teachings of the references; and (2) show that the references teach or suggest all of the claimed limitations. As discussed below, this rejection is respectfully traversed.

**Claim 1**

Jitaru does not disclose or suggest a saturable reactor operating in a range including a saturation region, as required by Claim 1. Jitaru discloses a parasitic magnetization inductance  $L_m$  that operates as an excitation inductance of the transformer T. The excitation inductance of Jitaru is operated in an unsaturated region. (See Fig. 1 and Column 8, lines 31 – Column 9, lines 53). The saturable reactor recited by Claim 1 does not operate as an excitation inductance. Jitaru fails to describe or suggest a saturable reactor operating in a range including a saturation region, as required by Claim 1. Accordingly, the Examiner has failed to show that Jitaru in combination with PA 1 and Hua, teaches or suggest all of the elements of Claim 1. The rejection is thus improper and should be withdrawn.

Additionally, in rejecting Claim 1, the Examiner alleged that the main diode 58 and load capacitance 64 of Jitaru (Fig. 1) corresponds to the rectifying/smoothing circuit recited by the claim. Jitaru describes that the secondary coil 52 is in a series circuit with a saturable inductor 56 and main diode 58, wherein the output of the circuit is provided to a load inductance 60, a load resistance 66 and load capacitance 64. (Column 9, lines 63-68). Figure 1 of Jitaru illustrates that a flywheel diode 62 is connected between the main diode 58 and load inductance 60, and the load capacitance 64 is connected across the output terminals.

The main diode 58 is not connected in series to the load capacitance 64 to form a rectifying/smoothing circuit connected in parallel with the secondary winding of the transformer as required by Claim 1.

In one embodiment illustrated in Figure 5, the first end of the secondary winding 5b is connected to the anode of the diode D1, and the cathode of the diode D1 and the second end of the secondary winding 5b are connected to the capacitor C4. (Fig. 5 and [0066]). Thus, a series circuit composed of the diode D1 and the capacitor C4 form the rectifying/smoothing circuit connected in parallel with the secondary winding 5b, wherein the capacitor C4 smoothes a rectified voltage of the diode D1 and provides a DC output to the RL.

A comparison of Figure 1 of Jitaru to Figure 5 of the present invention clearly illustrates that Jitaru does not disclose or suggest the rectifying/smoothing circuit as claimed. Jitaru fails to describe a rectifying/smoothing circuit connected in parallel with a secondary winding of the transformer and including a rectifying element and a smoothing element, as required by Claim 1. Therefore, the Examiner has failed to show that Jitaru in combination with PA 1 and Hua, teaches or suggest all of the elements of Claim 1. The rejection is thus improper and should be withdrawn.

**Claims 2-12, 15-22, 25, 26 and 28-36**

Claims 2-12, 15-22, 25, 26 and 28-36 depend from Claim 1. Accordingly, for at least the same reasons discussed above, Claims 2-12, 15-22, 25, 26 and 28-36 are patentable over Jitaru in view PA 1 and Hua.

**OBJECTION TO CLAIMS 13, 14, 23, 24, 27, 28 and 37-41**

Claims 13, 14, 23, 24, 27, 28 and 37-41 were objected to as being dependent upon a rejected base claim. Claims 13, 14, 23, 24, 27, 28 and 37-41 depend from Claim 1. As described above, it is submitted that Claim 1 is allowable over the cited references and thus these claims have not been rewritten.

Amendment and Response  
Serial No. 10/531,797  
(National Phase of PCT/JP2003/013411)  
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**CONCLUSION**

The foregoing is submitted as a complete response to the Office Action identified above. Applicant believes that this application is now in condition for allowance and solicits a notice to that effect. If there are any issues that can be addressed via telephone, the Examiner is asked to contact the undersigned at 404.685.6799. The Commissioner is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account 11-0855.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Brenda O. Holmes".

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Date: September 21, 2007